International Journal of Botany and Research (IJBR)
ISSN(P): 2277-4815; ISSN(E): 2319-4456
Vol. 4, Issue 4, Aug 2014, 11-16

TRANS STELLAR • Journal Publications • Research Consultancy

DIET OF *EURYPARYPHES* (ORTHOPTERA, PAMPHAGIDAE) IN ARID REGION OF DJELFA (ALGERIA)

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ABSTRACT

The present work is carried out in two stations of Fied el Borma and of Moudjebara located at Djelfa, at 300 km distance from Algiers south. The aim is to study diet of two Orthopteras species those *Euryparyphes sitifensis* (Brisout, 1854) and E.*quadridentatus* (Brisout 1852)). This study showed that in the station of Fied el Borma, total richness of consumed vegetable species is of 5 species for males' d'*Euryparyphes sitifensis* and 7 vegetable species are noted in females' faeces. Concerning station of Moudjebara, total richness in consumed vegetable species, is of 5 for either males and females. In terms of species, in Fied el Borma, most important consumed vegetable surfaces are noted for *Plantago albicans* with consumption rate of (56.75%) for males and (50.23%) for females. Higher relative frequencies in females' faeces show that *Plantago albicans* and *Eruca vesicaria* present a strong value reaching 83.3%. Relating to males, those frequencies reach until 75% regarding *Plantago albicans* and 50% to *Eruca vesicaria*. Whereas in Moudjebara, *Plantago albicans* is the most appreciated with consumption rate of 43.8% for males and 68.0% for females. Higher relative frequencies in males' faeces are attributed to *Plantago albicans(*Rf. % = 78, 6 %), followed by *Koeleria pubescens (*Rf. %= 35.7 %).

KEYWORDS: *Euryparyphes quadridentatus*, *Euryparyphes sitifensis*, Diet, Djelfa, Algeria

INTRODUCTION

Every year, locusts cause important damages to cultivation. Regarding importance of those damages in Algeria, orthopterologic fauna needs too much biology works, mainly diet's study in order to understand the appropriate conflict. Vegetation knowledge as habitat structure and as foods is preliminary to any understanding of distribution and of dynamic of locusts' populations(KHERBOUCHE 2006). BENHALIMA(1983), describes combination plant-locust as habitat indicator and of locust's specie distribution. For the purposes of this study we have considered to lead our work in region of Fied El Botma and Moudjebara.

MATERIALS AND METHODS

Region of Djelfa is located near of one of largest hot deserts, and mountainous reliefs of saharian Atlas. Station of Fied El Botma is located at altitude of 1063 m and with geographic coordinates N 34° 31' 46'' E 03° 46' 55". Global covering rate of the ground is of 40.01%, This is an esparto steppe (*Stipa tenacissima)* characterized by vegetable cover generally clear and with reduced size, ground not too much deep lying on calcareous crust and region of Moudjebara is located at altitude of 1.214 m with geographic coordinates N 34° 37' 58'' E 03° 19' 39''.Global covering rate of the

ground is of 20.47% (Figure 1) This is a steppe of white Artemisia (*Artemisia herba alba)* with combination of Chobrok (*Noaea mucronata)* ground's type is not too much stony, respectfully situated at 49 km and 26 km from Djelfa town.

To study *Euryparyphes'g*enus diet, we use technical treatments of faeces that are inspired by method of LAUNOIS-LUONG (1975). Implementation of quadrant consists to count present Orthopteras' individuals on determined surface. Effectively, with help of string of 12m long, it consists to demarcate squares or quadrant of 3 cm side, which gives a surface of 9 $cm^{2.}$(DAMERDJI, 2008). Sampling is made once a month from April 2007 until January 2008.

RESULTS AND DISCUSSIONS

Diet Qualitative Study

At Fied El Botma on 15 vegetable species present on the ground, only 4 have been found in males' faeces and 6 in females ones, and 2 undetermined species which are not present in the ground. Attracted plants belong to 5 families with two Poacae that are *Lygeum spartum* and *Hordeum vulgare*, one Anthemidae represented by *Artemisia campestris*, family of Plantaginaceae is represented by *Plantago albicans*, one Fabacae represented by *Ononis natrix*, and one Brassicacae represented by *Eruca vesicaria* (Table 1).

In station of Moudjebara on 13 species present on the ground, 4 vegetable species are identified in male's faeces and 4 species in females ones. Attracted plants by *Euryparyphes quadridentatus'* individuals belong to 4 different families with three Poaceae which are *Stipa parviflora, Schismus barbatus* and *Koeleria pubescens.* As for *Euryparyphes sitifensis* in station of Fied el Botma, total richness in vegetable species consumed by males is of 7 vegetables species with average richness of 1.25. Same value is noted in females with average richness of 1.16 (Table 2). According to BOUNECHADA (2007) *Ocneridia volxemi (*Orthoptera, Pamphagidae) has used for its diet 28 vegetable species among 36 species present in the region of Setif, this locust is considered as polyphagia specie. As regard to *Euryparyphes quadridentatus* in station of Moudjebara total richness in vegetable species consumed is of 5 for males and females, when average richness is of 0.36.

Diet Quantitative Study

At Fied El Borma, 5 vegetables species are consumed by *Euryparyphes sitifensis'* males (Table 3) notably *Plantago albicans* showing a strong relative frequency reaching 75%, *Eruca vesicaria* (Rf =50%), *Artemisia campestris, Lygeum spartum* species and undetermined specie 1 are the lesser found in faeces (Rf % = 25%). As for females, 7 vegetables species are noted in their faeces (Table 3). Relative frequencies of different vegetable species pointed out in their faeces show that *Plantago albicans* and *Eruca vesicaria* present high relative frequency reaching 83.3%. In second place comes *Artemisia campestris* (Rf % = 33,33%), followed by *Lygeum spartum, Hordeum vulgare*, *Ononis natrix* and undetermined specie 2(Rf % = 16.66%). Consumption of species on the ground is not proportional to covering rates. BELHADJ(2004) concerning diet of *Pyrgomorpha cognata, Acrotylus patruelis* and *Ochrilidia gracilis* in region of Ouargla, shows that among 9 species present in their biotope, only 6 have been ingested, it is about of two Poaceae, one Chenopodiaceae, one Fabaceae, one Frankeniaceae and one *Convolvulaceae*, for females and males. In other respects at Medea, SEGHIER(2002) as for *Calliptamus barbarus'* diet shows that males have consumed 11 vegetables species on 28 present on the ground belonging to 7 botanical families. Females trophic spectre seems being a little wide than males ones as so far as they have been fed of 14 species belonging to 8 botanical families.

In station of Moudjebara, higher relative's frequencies in males' faeces are allotted to *Plantago albicans (*Rf % = 78, 57%), followed by *Koeleria pubescens*(Rf % = 35.71 %) and by undetermined specie 3(Rf % = 35.71%). On the other hand, *Salvia verbenaca* and *Stipa parviflora* are species less represented (Rf %= 7.14%) (Table 4). MESLI (2007) shows for diet of main orthopteras species that 16 vegetables species are consumed by *Calliptamus barbarous;* they are shared between 10 families and 17 vegetable species are consumed by *Calliptamus wattenwylianus* and are spread between 8 families. 16 vegetable species form floristic cortege of *Oedipoda fuscocincta* and *Oedipoda caerulesens sulfuresens* is getting floristic cortege of 13 vegetables species divided between 6 families. As for females, different vegetables species' relative frequencies pointed out in faeces show that *Plantago albicans* keeps the first place with relative frequency of 71.42% (Table 4). In second place, there is *Koeleria pubescens* with 50 %, followed by undetermined specie 3 with 35.71%. *Artemisia herba alba* participates with frequency of 14.28% and *Schismus barbatus* with 7.14% (Table 4). Species selected by *Euryparyphes quadridentatus* does not depend of their abundance on the ground. DURANTON *and al (*1982) report that discovery of consumable plants is a difficulty that varies according to insect needs, environment where is living in and its abilities of food detection. These authors report that in presence of heterogenic vegetation, discovery's probability depends of lucks to meet between insects and host-plant. It is then linked at the time to vegetable volume, to locust's ambulatory capacities, but also to capacity which this one possesses to detect at a distance interesting vegetable species.

CONCLUSIONS

The results found in this study after This study allowed us to make an approach on diet's composition of *Euryparyphes sitifensis* and *Euryparyphes quadridentatus*. The high number of plant species consumed by these two Orthoptera show the severe damage caused by locusts in arid regions which affect the economy. This subject consequently remains matters to much others interesting investigations. It is why in prospect; it would be also useful de study bio-ecology of main species present in our study's region and in other region of Algeria to specify species of economical importance in order to advocate appropriate struggle methods.

REFERENCES

1. BENHALIMA T.(1983). Etude expérimentale de la niche trophique de *Dociostaurus maroccanus* (Thunberg, 1815) en phase solitaire au Maroc. Thèse Doctorat.
2. BELHADJ H.(2004). Bioécologie des orthoptères dans la cuvette de Ouargla et régime alimentaire de Pyrgomorphacognata (krauss, 1877), Acrotyluspatruelis (Herrich Schaeffer, 1838), et Ochrilidiagracilis (Krauss, 1902). Thèse Magister, El Harrach.
3. BOUNECHADA M., 2007. Recherches sur le Orthoptère étude bioécologique et essais de lutte biologique sur *OcneridiaVolxemi Bol (*Orthoptera, Pamphagidae) dans la région de Sétif.Thèse Doctorat d'état es–sciences..
4. DAMERDJI A. (2008). Systématique et bio – écologie de différents groupes de Gasteropodes et Orthoptères selon un transect nord – sud Ghazaouet – EL – Aricha. Thèse Doctorat, El Harrach.
5. DURANTON J.F., LAUNOIS–LUONG M. M. et LECOQ M.(1982). Manuel de protection acridienne en zone tropicale sèche. Ed. Gerdat, Paris.

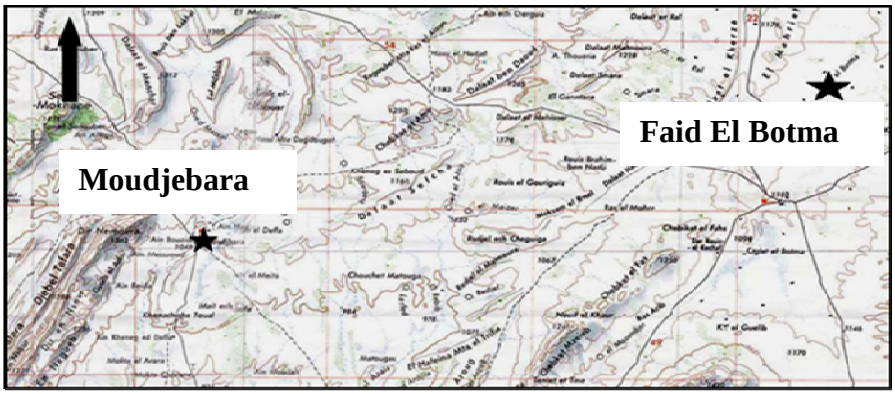
6. KHERBOUCHE Y. (2006). Etude de quelques aspects bioécologiques de la sauterelle pèlerine *Schistocerca grégaria* Forskäl (1775) (Acrididae, Cyrtacanthacridinae) dans la région d'Adrar (Sahara, Algérie). Thèse Magister, El Harrach.

7. LAUNOIS–LUONG M. H.(1975). Méthode d'étude dans la nature du régime alimentaire du criquet migrateur *Locusta migratoria capito* (Sauss). Ann. Zool. écol. anim., 8(1) : 25 – 32.

8. MESLI L.(2007). Contribution à l'étude bio–écologie et régime alimentaire des principales espèces d'orthoptères dans la wilaya de Tlemcen, Thèse Doctorat, Université de Tlemcen.

9. SEGHIER M.(2002). Etude bioécologique des Orthoptères dans trois milieux différents. Régime alimentaire de *Calliptamus barbarus* (Orthoptera, Acrididae) dans la région de Médéa. Thèse Magister, El Harrach.

APPENDICES



Source: National Institute of Cartography(Algiers)

Figure 1: Geographical Presentation of Djelfa and Location of the Two Study Sites

Table 1: Covering Rate of Vegetable Species and Their Presence or Absence in Faeces of *Euryparyphes sitifensis* in Station of Fied El Botma

Plant Species in the Field	CR%	Présence Dans Les Fèces	
		Males	Females
Stipa tenacissima	35,1%	A	A
Lygeum spartum	3%	P	P
Hordeum vulgare	0,03%	A	P
Bromu srubens	0,06%	A	A
Artemisia herba alba	0,94%	A	A
Artemisia campestris	0,19%	P	P
Onopordon arenarium	0,05%	A	A
Echinops spinosus	0,04%	A	A
Launaea glomerata	0,14%	A	A
Plantago albicans	0,07%	P	P
Ononis natrix	0,05%	A	P
Astragalus armatus	0,03%	A	A
Eruca vesicaria	0,25%	P	P
Salvia verbenaca	0,02%	A	A
Hernaria hirsuta	0,04%	A	A

CR %: Covering Rate; A: Absence; P: Presence

Table 2: Covering Rate of Vegetable Species and Their Presence or Absence in Faeces of *Euryparyphes quadridentatus* in Station of Moudjebara

Plant Species in the Field	CR%	Présence Dans Les Fèces	
		Males	Females
Stipa Parviflora	0,04	P	A
Bromus Rubens	0, 3	A	A
Koeleria Pubescens	0,16	P	P
Schismus Barbatus	0,03	A	P
Dactylis Glomerata	3	A	A
Artemisia Herba Alba	10,9	A	P
Plantago Albicans	0, 32	P	P
***Euphorbia* Sp.**	0,02	A	A
Echinops Spinosus	0,01	A	A
Noaea Mucronata	6,52	A	A
***Helianthemum* Sp.**	0,04	A	A
Atractylis Polycephalus	0,03	A	A
Salvia Verbenaca	0,1	P	A

CR %: Covering Rate; A: Absence; P: Presence

Table 3: Relative Frequency Rf(%) of Different Vegetable Species Consumed by *Euryparyphes sitifensis* in Faid El Botma

Plant Species	Rf(%)	
	Males	Females
Plantago Albicans	75%	83,33%
Eruca Vesicaria	50%	83,33%
Artemisia Campestris	25%	33,33%
Lygeum Spartum	25%	16,66%
Hordeum Vulgare	–	16,66%
Ononis Natrix	–	16,66%
sp. 1 und.	25%	–
sp. 2 und.	–	16,66%

Rf(%) : Relative Frequency; Sp. Ind. Unidentified Species

Table 4 : Relative Frequency Rf(%) of Different Vegetable Species Consumed by *Euryparyphes quadridentatus* in Moudjebara

Plant Species in the Field	Rf%(%)	
	Males	Females
Plantagoalbicans	78,57%	71,42%
Koeleriapubescens	35,71%	50%
Artemisia Herba Alba	–	14,28%
Schismusbarbatus	–	7,14%
Salviaverbenaca	7,14%	–
Stipa Parviflora	7,14%	–
Sp. Und	35,71%	35,71%

Rf(%) : Relative Frequency; Sp. Ind. Unidentified Species